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Psychological momentum in football: the impact of a last-minute equalizer in a knock-out match

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ABSTRACT

What could be the impact of a last-minute equalizer on players' psychological momentum (PM) in a high-stake, knock-out football match? In the current study, 86 competitive male players were asked to imagine that they were playing in a cup final in which they were trailing 1–0 or leading 1–0. Subsequently, participants watched a video clip in which their team or the opponent team scored the equalizer either in the 61st minute or 92nd minute (i.e., last-minute) of regular playing time. Participants indicated their PM after the equalizer. Although the situation became objectively neutral (1–1), results showed that PM was higher when players' own team scored than when the opponent team did. More importantly, the equalizer had a particularly big impact on PM when the goal was scored last-minute. These results provide a better understanding of PM processes in football, and may explain the euphoria or despair of football players after a last-minute equalizer in a high-stake match.

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KEYWORDS
Psychological momentum; sport psychology; knock-out match; resilience; coping

In the Champions League final of 2014, the two arch-rivals from Madrid delivered an exciting match. After Atletico Madrid scored in the first half, they kept the lead until the last minute of the regular playing time. At that moment, Sergio Ramos scored the equalizer for Real Madrid, which turned the momentum. In the extra time Real Madrid dominated Atletico Madrid and they ultimately won by 4–1. This match is just one of the examples in which a last-minute goal was scored that led to a spectacular momentum turn (for a list of notable last-minute goals, see https://en.wikipedia.org/wiki/Last-minute_goal). Last-minute goals are particularly exciting if a team seems to be losing, but then equalizes the match at the end of regular time, and possibly continues to win the match (Groot and Zoutenbier 2014). What happens in the minds of the players in such a scenario, and how can we explain this? In the current study we empirically investigated the psychological impact of the last-minute goal using the perspective of *psychological momentum* (PM).

Researchers have defined PM as the perception of moving toward (positive PM) or away from (negative PM) a desired goal or outcome (e.g., Adler 1981; Vallerand et al. 1988; Markman and Guenther 2007; Gernigon et al. 2010; Den Hartigh et al. 2014). This perception elicits changes in a network of psychological variables, such as experiencing confidence, control, optimism, and motivation (e.g., Vallerand et al. 1988; Miller and Weinberg 1991; Eisler and Spink 1998; Perreault et al. 1998; Briki et al. 2014; Den Hartigh and Gernigon 2018). Importantly, the PM experience of players primarily depends on how a match unfolds, rather than just the current situation in a match (Gernigon et al. 2010; Den Hartigh et al. 2014, 2016; Den Hartigh and Gernigon 2018). For example, the situation in a football match can be objectively neutral with a score of 1–1. Nevertheless, in contrast to their opponent, the players of one team may have positive PM, because they just scored the equalizer. In this case, scoring 1–1 would lift the perception of moving toward the desired victory, and thereby the PM experience of the football players (Den Hartigh and Gernigon 2018).

PM research across different sports has indeed shown that athletes develop positive PM when moving toward the victory, and negative PM when moving away from it (e.g., Shaw et al. 1992; Perreault et al. 1998; Briki et al. 2013, 2014; Den Hartigh and Gernigon 2018). For instance, in experimental studies outside football, researchers have manipulated match scenarios to provide insights into athletes' PM processes. Den Hartigh et al. (2014) let teams of two rowers compete on rowing ergometers against a virtual opponent team. This race was displayed on a screen in front of the ergometers, and the rowers responded each minute to questions assessing their PM experience. The authors found that rowers' PM experience changed positively when they came back from being 6 seconds behind to leading with 6 seconds. In turn, when rowers were leading with 6 seconds, but started losing seconds until they were 6 behind, their PM changed negatively. In line with the effects of manipulated match scenarios on PM, football players typically report that scoring or conceding goals triggers a positive or negative PM, respectively (Jones and Harwood 2008; Redwood-Brown et al. 2018).

Because 'time or distance left from the outcome' likely influences the PM process, previous experimental PM studies did not inform the participants about this variable (e.g., Briki et al. 2013; Den Hartigh et al. 2014, 2016). Hence, researchers attempted to avoid a conflation between the effect of moving toward and away from the outcome, and the time or distance

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left (for a discussion, see Gernigon et al. 2010). Here, we argue that it is important to explicitly address the effect of these variables to better understand PM processes. Would the psychological impact of the equalizer by Real Madrid have been the same if they scored it 30 minutes earlier?

The purpose of this study was to propose and demonstrate that the moment at which the equalizer is scored in a football match, has an effect on PM. In other words, when moving toward or away from a desired outcome, the current distance from that outcome matters (cf. Hubbard 2015). In line with previous research, our first hypothesis was that PM is higher when the own team scores the equalizer than when the opponent scores (e.g., Vallerand et al. 1988; Briki et al. 2014; Den Hartigh and Gernigon 2018). More importantly, given the idea that the distance from the outcome matters, our second hypothesis was that the impact of the equalizer on players' PM is particularly high when the goal is scored last-minute (i.e., in the 92nd minute) compared to an earlier moment in the match (i.e., in the 61st minute). Specifically, we hypothesized that players' PM is *higher* when the own team scores in the 92nd minute than in the 61st minute, and *lower* when the opponent scores in the 92nd minute than in the 61st minute.

Materials and methods

Participants

Eighty-six male football players (M_{age} = 25.29, *SD* = 5.21) participated in this study. They played competition in different teams at national or regional level, ranging from the premier (National) amateur division to the sixth division in The Netherlands. The average duration of playing competition was 16.63 years (*SD* = 5.22). Participants were recruited from different football clubs in north of The Netherlands, and were approached by e-mail or in person. They were randomly assigned to one of four conditions in a 2 × 2 design (Scoring Team: Own team vs. Opponent × Scoring Moment: 61st minute vs. 92nd minute).

Procedure and materials

The study was carried out with each participant individually in the boardrooms of their football clubs. After participants provided their written consent and filled out their demographic information, they were given a form with a written scenario of a football match, including a picture with a team in green shirts and a team in white shirts. This picture was a screenshot of a clip from a match in the IFA Premier league (Ireland), which was unfamiliar to the participants. In the scenario, the team of the participant was playing in an important cup final against their rival. Earlier in the season, they already played against each other in a match that ended in 2–2. Again in the current match, there were many supporters of the own team and the opponent team, there were fierce duels, and the match was tied. Then, participants read that a goal was scored in the 25th minute, and that the score remained 1–0 for the remainder of the first half and into the second half. The written scenarios were identical for each player, except that 43 players had to imagine that they were a player of the green team (trailing 1–0) whereas the other half had to imagine being a player of the white team (leading 1–0). In addition, 43 players in the green and white teams read that it remained 1–0 until the 60th minute (relatively far from the outcome), whereas the other half read that it remained 1–0 until the 91st minute (very close to the (un)desired outcome). Furthermore, it was explained that if this knock-out match is tied after normal time, the match would be forced into extra time.

After reading the scenario, the participants watched a short high-definition video clip on a computer screen, in which the green team scored the equalizer. After the goal, a text appeared on the screen with: *The equalizer! It is now 1–1 in the 61st (or 92nd) minute … Please indicate how you experience this moment*. The questionnaire contained 5 items, selected from Vallerand et al.'s (1988) PM scale: *Now, at this moment in the 61st (or 92nd) minute …* 1) *Which team progresses most towards the victory?*; 2) *Which team is the most confident?*; 3) *Which team is the most discouraged?* (reversed item); 4) *Which team is the most motivated?*; 5) *Which team has the most control over the match?* (1 = *Definitely the opponent*, 7 = *Definitely we*). The internal consistency of this measure was high (α = .79). Finally, in order to check whether participants could imagine themselves in the scenario, they responded to the following question after answering the PM items: *To what extent were you able to imagine yourself in the scenario?* (1 = *Not at all*, 7 = *Very well*).

Results

First of all, participants indicated they were well-able to imagine themselves in the scenario (*M* = 6.00, *SD* = .98). We also checked whether there were differences between conditions in the scores on this question, by conducting a 2 × 2 ANOVA (Scoring Team: Own team vs. Opponent × Scoring moment: 92nd minute vs. 61st minute). No significant effects were found for Scoring team ($F(1, 82) = .009$, $p = .92$), Scoring moment ($F(1, 82) = .29$, $p = .59$), and Scoring Team × Scoring moment ($F(1, 82) = .29$, $p = .59$).

To test our hypotheses, we conducted the same ANOVA with PM as the dependent variable after confirming that the ANOVA assumptions (e.g., normality) were met. PM was higher when the own team scored the equalizer (*M* = 5.22, *SD* = .95), than when the opponent scored the equalizer (*M* = 3.00, *SD* = 1.06), $F(1, 82) = 175.30$, $p < .001$, $\eta_p^2 = .68$, which supports the first hypothesis. There was a marginally significant main effect of Scoring Moment, $F(1, 82) = 2.87$, $p = .09$, $\eta_p^2 = .03$. Most importantly, both main effects were superseded by the anticipated Scoring Team × Scoring Moment interaction, $F(1, 82) = 54.93$, $p < .001$, $\eta_p^2 = .40$.

As shown in Figure 1, our data provide empirical support for Hypothesis 2: The impact of the equalizer on players' PM is particularly high when the goal is scored last-minute. Specifically, follow-up contrast analyses revealed that when the own team scored the equalizer, players' PM was higher in the 92nd minute (*M* = 6.00, *SD* = .70) than in the 61st minute (*M* = 4.47, *SD* = .36), $F(1, 41) = 81.53$, $p < .001$, $\eta_p^2 = .67$. In contrast, when the opponent scored the equalizer in the

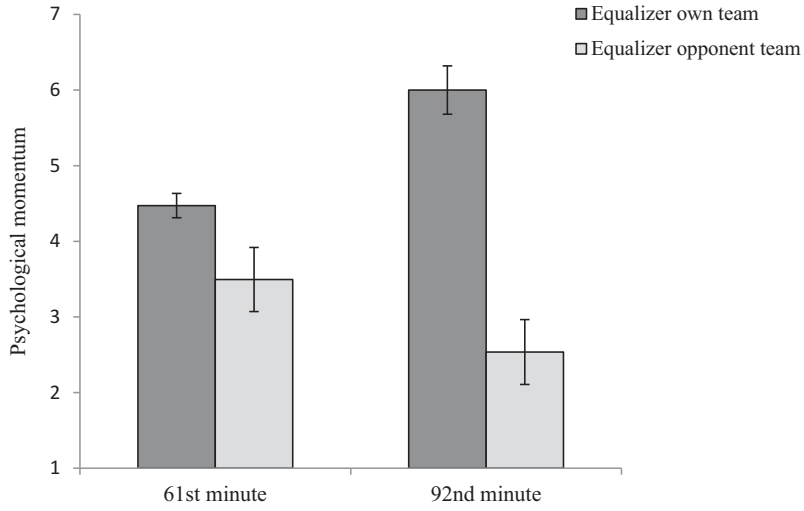

Figure 1. PM after the equalizer as a function of scoring team and scoring moment. Error bars correspond to the 95% confidence intervals.

92nd minute (M = 2.53, SD = .97), players' PM was lower than when the opponent scored in the 61st minute (M = 3.50, SD = .93), $F(1, 41) = 10.96$, $p = .002$, $\eta_p^2 = .21$.

Additional contrasts indicate that when the equalizer was scored in the 92nd minute, players' PM was much higher when the own team scored the equalizer than when the opponent did, $F(1, 41) = 179.32$, $p < .001$, $\eta_p^2 = .81$. When the equalizer was scored in the 61st minute, the differences were significant as well, albeit less pronounced. That is, PM was higher when the own team scored than when the opponent did, $F(1, 41) = 20.95$, $p < .001$, $\eta_p^2 = .34$.

Discussion

Many historic football matches involve a moment that turned the match. Although such a moment may turn the situation into objectively neutral (e.g., an equalizer), it could have a significant impact on the subjective experience of the players. The reason is that athletes can experience positive or negative PM at a neutral score, depending on how the score came about (e.g., Vallerand et al. 1988; Miller and Weinberg 1991; Eisler and Spink 1998; Briki et al. 2014; Den Hartigh and Gernigon 2018). By scoring or conceding a goal, a team moves toward or away from the victory, which typically elicits positive or negative PM, respectively (Redwood-Brown et al. 2018). Furthermore, the distance from the outcome may affect the psychological impact of the goal, although this had never been empirically tested (Hubbard 2015). An interesting question therefore remained: What is the impact of a last-minute equalizer on players' psychological momentum (PM) in a high-stake, knock-out football match?

In line with earlier findings across sports, findings of the current study showed that PM differed depending on whether one's own team scored the equalizer or the opponent (e.g., Vallerand et al. 1988; Miller and Weinberg 1991; Shaw et al. 1992; Eisler and Spink 1998; Markman and Guenther 2007; Briki et al. 2014; Den Hartigh and Gernigon 2018). To be more concrete, PM was higher when the own team tied the score to 1–1, than when the opponent tied the score. Our findings extend previous research by showing that the moment at which the own team or opponent makes the goal clearly influenced the positive or negative PM of the football players. Relative to an equalizer scored in the 61st minute, a last-minute equalizer had a bigger psychological impact, that is, a stronger positive effect when scored by one's own team, and a stronger negative effect when scored by the opponent. This finding supports the idea that, when moving toward or away from a desired outcome, the current distance from that outcome matters (cf. Hubbard 2015).

The big impact of a last-minute equalizer is in accordance with an earlier PM study, in which Miller and Weinberg (1991) suggested that the criticality of the match situation is important in determining the effect of scoring on PM. The authors found that volleyball players believed that their team would possess more confidence, less anxiety, and more momentum than their opponent when coming back from 10–13 to 13–13, but not when coming back from 2–5 to 5–5. Furthermore, our findings are in accordance with a well-known phenomenon in psychology, according to which perceiving an outcome as nearly (but ultimately not) occurring has powerful psychological consequences (e.g., Medvec et al. 1995; Markman et al. 2007). More specifically, almost attaining the desired outcome makes the counterfactual outcome (e.g., We could have won!) more salient than when not having been close to the desired outcome (Medvec et al. 1995). Although this phenomenon has primarily been demonstrated in the context of encountering negative events, our results indicate that this counterfactual thinking may have a major effect in case of a positive scenario as well: We could have lost, but we are back in the match again!

A limitation of the current study is that players had to imagine scoring or conceding the equalizer, they did not actually play and experience the equalizer. Although exposing players to identical (hypothetical) scenarios improved experimental control, players' actual responses to comparable situations in a match might be different. Qualitative follow-up research could provide additional insights into how players

feel and act in similar situations, especially situations in which they score or concede an equalizer in the last minute of a high-stake match. In addition, future research may examine inter-individual differences in the way in which players respond to such an equalizer.

An interesting question from a practical point of view is whether the psychological effect of the equalizer has consequences for the ultimate performance outcome of the match, as appeared to be the case in the Real Madrid – Atletico Madrid Champions League final in 2014. Such striking momentum turns are often remembered by players, coaches, and spectators, and people generally believe that PM is connected to success (e.g., Adler 1981; Taylor and Demick 1994; Markman and Guenther 2007; Iso-Ahola and Dotson 2014, 2016). Researchers have indeed shown that football players believe that positive PM results in better achievements, whereas negative PM is believed to impair performance (Jones and Harwood 2008; Redwood-Brown et al. 2018). Of course, performance outcomes in football are dependent on various factors, which makes it difficult to statistically determine the effects of PM. Nevertheless, it would be interesting to further investigate the relation between momentum scenarios and (subsequent) performance patterns in football.

From a sport psychology perspective, it may pay off to provide players with strategies to 'bounce back' after a last-minute equalizer (Galli and Vealey 2008; Galli and Gonzalez 2015). For instance, a recent study suggests that acceptance commitment training can help team athletes to prepare for and handle setbacks that may occur at major championships (Henriksen 2018). In this type of training players learn to accept the (negative) thoughts and emotions that accompany a setback, such as a last-minute equalizer, and to mindfully re-engage in the tasks to be carried out.

In conclusion, this is the first PM study to empirically investigate the psychological effects of scoring or conceding an equalizer in football, and the moment at which this occurs. The most interesting result of our experiment was that particularly a last-minute equalizer in a knock-out match had a big psychological impact on the players. This may explain the euphoria and despair that is often observed in two teams when such a scenario occurs, such as in a Champions League match, or in a Continental- or World Cup.

Disclosure statement

No potential conflict of interest was reported by the authors.

Data availability statement

The data that support the findings of this study are openly available in Dataverse at https://hdl.handle.net/10411/QB7OHO.

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